5. Eagles

Program Name: Eagles.java Input File: eagles.dat

Hermit Joe lives in a desolate area of Alaska. The Alaskan Wildlife Management team has given him several maps of the area surrounding his cabin that show the location of the homes of different types of animals. The characters on the map represent different animals that live in the area. For example, the letter `E` represents an eagle's nest, the letter `B` represents a brown bear den, the letter `M` represents a moose habitat, etc. Being an avid bird watcher, Joe is especially interested in where in the area that the eagles have nests. Being afraid of both bears and moose, Joe will go around any moose habitat and any brown bear den. He will go through the home or habitat of any other animal. You are to write a program that, given a 10x10 rectangular grid of the area, will determine the closest to his cabin he can find an eagle's nest.

Input

The first line of input will contain a single integer `n` that indicates the number of maps to be checked. For each map, the first line will contain two integers `r c` that indicate the coordinates of the cabin followed by ten lines (rows) with ten characters (columns) and no spaces on each row. The coordinate of the upper left corner of the map is `1 1` and the coordinates of the lower right corner is `10 10`. All characters in the map will be either an uppercase letter of the alphabet that represents an animal's home or a period (`.`) that represents an area without a major animal home. There will be exactly one `J` on the map to denote the location of Joe's cabin.

Output

For each map, you will print the least number of cells Joe must traverse to arrive at an eagle's nest without entering a moose habitat or a brown bear's den. Joe may move horizontally, vertically, or diagonally. Do not count the cell with Joe's cabin but do count the cell containing the eagle's nest.

Note: There will always be an eagle's nest that Joe can reach.

Example Input File

```
1
9 10
E...E..B.M
...B....ME
BBBCC.BBMM
EBBCCFFBMM
MMMM..B..M
MMM.B..FF.
MMMMFFFMMM
CCCCM..MMM
BECMM...FJ
..CMMFF.B.
```

Example Output to Screen

```
8
```